

WHAT IS CLAIMED IS:

1                   1.       An isolated nucleic acid encoding an estrogen-regulated  
2 unconventional myosin-related protein, said protein having at least one of the following  
3 characteristics:

4                   (1) comprising at least about 70% amino acid sequence similarity to a  
5 sequence selected from the group consisting of SEQ ID NOs: 1, 4, and 6; or

6                   (2) specifically binding to polyclonal antibodies generated against a  
7 polypeptide comprising an amino acid sequence selected from the group consisting of  
8 SEQ ID NOs: 1, 4 and 6.

1                   2.       The nucleic acid of claim 1, wherein said protein is at least about  
2 70% identical to a sequence selected from the group consisting of SEQ ID NOs:1, 4, and  
3 6.

1                   3.       The nucleic acid of claim 1, wherein said nucleic acid encodes a  
2 protein comprising an amino acid sequence selected from the group consisting of SEQ ID  
3 NOs: 1, 4 and 6.

1                   4.       The nucleic acid of claim 1, wherein said nucleic acid comprises a  
2 nucleotide sequence that is at least about 70% similar to a sequence selected from the  
3 group consisting of SEQ ID NOs: 2, 3, 5, and 7.

1                   5.       The nucleic acid of claim 4, wherein said nucleic acid comprises a  
2 nucleotide sequence that is at least about 70% identical to a sequence selected from the  
3 group consisting of SEQ ID NOs: 2, 3, 5, and 7.

1                   6.       The nucleic acid of claim 4, wherein said nucleic acid comprises a  
2 nucleotide sequence selected from the group consisting of SEQ ID NOs: 2, 3, 5 and 7.

1                   7.       The nucleic acid of claim 1, wherein said nucleic acid hybridizes  
2 under moderately stringent wash conditions to a nucleic acid comprising a nucleotide  
3 sequence selected from the group consisting of SEQ ID NOs: 2, 3, 5 and 7.

1                   8.       The nucleic acid of claim 7, wherein said nucleic acid hybridizes  
2 under stringent wash conditions to a nucleic acid comprising a nucleotide sequence  
3 selected from the group consisting of SEQ ID NOs: 2, 3, 5 and 7.

- 1 9. The nucleic acid of claim 1, wherein said nucleic acid is from a  
2 mouse.
- 1 10. An expression cassette comprising the nucleic acid of claim 1.
- 1 11. An isolated eukaryotic cell comprising the expression cassette of  
2 claim 10.
- 1 12. An isolated estrogen-regulated unconventional myosin-related  
2 protein, said protein having at least one of the following characteristics:  
3 (1) comprising at least about 70% amino acid sequence similarity to a  
4 sequence selected from the group consisting of SEQ ID NOs: 1, 4, and 6; or  
5 (2) specifically binding to polyclonal antibodies generated against a  
6 polypeptide comprising an amino acid sequence selected from the group consisting of  
7 SEQ ID NOs: 1, 4 and 6.
- 1 13. The protein of claim 12, wherein said protein comprises at least  
2 about 70% amino acid sequence identity to a sequence selected from the group consisting  
3 of SEQ ID NOs: 1, 4 and 6.
- 1 14. The protein of claim 12, wherein said protein comprises an amino  
2 acid sequence selected from the group consisting of SEQ ID NOs: 1, 4 and 6.
- 1 15. The protein of claim 12, wherein said protein is from a mouse or a  
2 human.
- 1 16. An antibody that selectively binds to the estrogen-regulated  
2 unconventional myosin-related protein of claim 12.
- 1 17. A method of modulating the effects of estrogen in a mammalian  
2 cell, said method comprising modulating the level of expression or activity of the  
3 estrogen-regulated unconventional myosin-related protein of claim 12 in said cell.
- 1 18. The method of claim 17, wherein said level of expression of said  
2 estrogen-regulated unconventional myosin-related protein is modulated by introducing a  
3 polynucleotide into said cell, whereby the presence or expression of said polynucleotide

4 modulates said level of expression of said estrogen-regulated unconventional myosin-  
5 related protein.

1 19. The method of claim 18, wherein said polynucleotide encodes a  
2 full-length estrogen-regulated unconventional myosin-related protein of claim 12, and  
3 wherein expression of said polynucleotide increases said level of expression of said  
4 estrogen-regulated unconventional myosin-related protein.

1 20. The method of claim 18, wherein said polynucleotide is an  
2 antisense sequence, and wherein the presence or expression of said polynucleotide  
3 decreases said level of expression of said estrogen-regulated unconventional myosin-  
4 related protein.

1 21. The method of claim 17, wherein a compound is administered to  
2 said cell, whereby said level of said expression or activity of said estrogen-regulated  
3 unconventional myosin-related protein is modulated.

1 22. The method of claim 17, wherein said effects of estrogen are  
2 mediated by an estrogen receptor  $\alpha$ .

1 23. The method of claim 17, wherein said effects of estrogen are  
2 mediated by an estrogen receptor  $\beta$ .

1 24. The method of claim 17, wherein said cell is present in a mammal.

1 25. The method of claim 24, wherein said level of expression or  
2 activity of said estrogen-regulated unconventional myosin-related protein is increased,  
3 whereby the development of atherosclerosis or osteoporosis in said mammal is inhibited.

1 26. The method of claim 24, wherein said level of expression or  
2 activity of said estrogen-regulated unconventional myosin-related protein is decreased,  
3 whereby the development of breast cancer in said mammal is inhibited.

1 27. A method of detecting the presence of estrogen signaling in a  
2 mammalian cell, the method comprising detecting the expression of the nucleic acid of  
3 claim 1 in the cell.

1                   28.     The method of claim 27, wherein said presence of estrogen  
2 signaling in said cell is used in order to determine the responsiveness of said cell to  
3 estrogen.

1                   29.     The method of claim 27, wherein said presence of estrogen  
2 signaling in said cell is used in order to determine the tissue-specific distribution of  
3 estrogen signaling in a mammal.

1                   30.     The method of claim 27, wherein said estrogen signaling is  
2 mediated by an estrogen receptor  $\alpha$ .

1                   31.     The method of claim 27, wherein said expression of said nucleic  
2 acid in said cell is detected by detecting the expression or activity of the protein of claim  
3 12 in said cell.

1                   32.     The method of claim 27, wherein said expression of said nucleic  
2 acid in said cell is detected by detecting the level of estrogen-regulated unconventional  
3 myosin mRNA in said cell.

1                   33.     A method of identifying a compound capable of acting as an  
2 estrogen-receptor agonist or antagonist, the method comprising:  
3                   (1) contacting a cell comprising an estrogen receptor with said compound;  
4 and  
5                   (2) detecting the functional effect of said compound on said cell,  
6 wherein an increase in the level of estrogen regulated unconventional  
7 myosin-related mRNA, protein, or protein activity in said cell indicates that said  
8 compound is capable of acting as an estrogen receptor agonist, and wherein a decrease  
9 in the level of estrogen regulated unconventional myosin-related mRNA, protein, or  
10 protein activity in said cell indicates that said compound is capable of acting as an  
11 estrogen receptor antagonist.

1                   34.     The method of claim 33, wherein said estrogen receptor is an  
2 estrogen receptor  $\alpha$ .

1                   35.     The method of claim 33, wherein said estrogen receptor is an  
2 estrogen receptor  $\beta$ .

1                   36.     The method of claim 33, wherein said estrogen-regulated  
2     unconventional myosin-related mRNA is at least about 70% similar to a nucleotide  
3     sequence selected from the group consisting of SEQ ID NOs: 2, 3, 5, and 7.

1                   37.     The method of claim 36, wherein said estrogen-regulated  
2     unconventional myosin-related mRNA is at least about 70% identical to a nucleotide  
3     sequence selected from the group consisting of SEQ ID NOs: 2, 3, 5 and 7.

1                   38.     The method of claim 33, wherein said estrogen-regulated  
2     unconventional myosin-related protein is at least about 70% similar to an amino acid  
3     sequence selected from the group consisting of SEQ ID NOs: 1, 4, and 6.

1                   39.     The method of claim 38, wherein said estrogen-regulated  
2     unconventional myosin-related protein is at least about 70% identical to an amino acid  
3     sequence selected from the group consisting of SEQ ID NOs: 1, 4, and 6.